

# Erratum: Assessment of uncertainties in QRPA $0\nu\beta\beta$ -decay nuclear matrix elements [Nucl. Phys. A 766, 107 (2006)]

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In a subsequent analysis a coding error was discovered in the treatment of the short range correlations. Correcting the error resulted in an increase of the neutrinoless double beta decay matrix elements. Here we provide the most relevant correct numerical results. The corrected Table (replacing Table 1 of the paper) and the corrected figure (replacing Fig. 2 of the paper) are shown.

While the matrix elements are now larger, our basic claim that the chosen way of adjusting the interaction strength makes the matrix elements essentially independent on the size of the single particle basis, on the parametrization of the G-matrix, whether QRPA or RQRPA is used (although, as seen, QRPA results in  $\sim 10\%$  larger matrix elements than RQRPA), and whether  $g_A$  is quenched or not remains true.

TABLE I: Averaged  $0\nu\beta\beta$  nuclear matrix elements  $\langle M^{0\nu} \rangle$  and their variance  $\sigma$  (in parentheses) evaluated in the RQRPA and QRPA. In column 6 the variance  $\varepsilon_{exp.}$  of the  $0\nu\beta\beta$ -decay matrix element due to uncertainties in the measured  $2\nu\beta\beta$ -decay half-live  $T_{1/2}^{2\nu-exp}$  is given.  $M_{GT}^{exp}$  and  $g_A$  denote the  $2\nu\beta\beta$ -decay nuclear matrix element deduced from  $T_{1/2}^{2\nu-exp}$  and axial-vector coupling constant, respectively. In column 7 the  $0\nu\beta\beta$  half-lives evaluated with the RQRPA average nuclear matrix element and for assumed  $\langle m_{\beta\beta} \rangle = 50$  meV are shown. For  $^{136}\text{Xe}$  there are four entries; the upper two use the upper limit of the  $2\nu$  matrix element while the lower two use the ultimate limit, vanishing  $2\nu$  matrix element.  $^{150}\text{Nd}$  is included for illustration. It is treated as a spherical nucleus; deformation will undoubtedly modify its  $0\nu$  matrix element.

Nuclear transition	$g_A$	$M_{GT}^{exp}$ [MeV <sup>-1</sup> ]	$\langle M^{0\nu} \rangle$		$\varepsilon_{exp.}$	$T_{1/2}^{0\nu}$ ( $\langle m_{\beta\beta} \rangle = 50$ meV) [yrs]
			RQRPA	QRPA		
$^{76}\text{Ge} \rightarrow ^{76}\text{Se}$	1.25	$0.15 \pm 0.006$	3.92(0.12)	4.51(0.17)	$\pm 0.05$	$0.86^{+0.08}_{-0.07} 10^{27}$
	1.00	$0.23 \pm 0.01$	3.46(0.13)	3.83(0.14)	$\pm 0.06$	$1.10^{+0.13}_{-0.11} 10^{27}$
$^{82}\text{Se} \rightarrow ^{82}\text{Kr}$	1.25	$0.10 \pm 0.009$	3.49(0.13)	4.02(0.15)	$\pm 0.08$	$2.44^{+0.32}_{-0.26} 10^{26}$
	1.00	$0.16 \pm 0.008$	2.91(0.09)	3.29(0.12)	$\pm 0.08$	$3.50^{+0.46}_{-0.38} 10^{26}$
$^{96}\text{Zr} \rightarrow ^{96}\text{Mo}$	1.25	$0.11^{+0.03}_{-0.06}$	1.20(0.14)	1.12(0.03)	$^{+0.12}_{-0.23}$	$0.98^{+1.1}_{-0.31} 10^{27}$
	1.00	$0.17^{+0.05}_{-0.1}$	1.12(0.11)	1.21(0.07)	$^{+0.12}_{-0.25}$	$1.12^{+1.3}_{-0.35} 10^{27}$
$^{100}\text{Mo} \rightarrow ^{100}\text{Ru}$	1.25	$0.22 \pm 0.01$	2.78(0.19)	3.34(0.19)	$\pm 0.02$	$2.37^{+0.41}_{-0.32} 10^{26}$
	1.00	$0.34 \pm 0.015$	2.34(0.12)	2.71(0.14)	$\pm 0.02$	$3.33^{+0.47}_{-0.39} 10^{26}$
$^{116}\text{Cd} \rightarrow ^{116}\text{Sn}$	1.25	$0.12 \pm 0.006$	2.42(0.16)	2.74(0.19)	$\pm 0.02$	$2.86^{+0.50}_{-0.39} 10^{26}$
	1.00	$0.19 \pm 0.009$	1.96(0.13)	2.18(0.16)	$\pm 0.02$	$4.39^{+0.77}_{-0.61} 10^{26}$
$^{128}\text{Te} \rightarrow ^{128}\text{Xe}$	1.25	$0.034 \pm 0.012$	3.23(0.12)	3.64(0.13)	$\pm 0.09$	$4.53^{+0.64}_{-0.53} 10^{27}$
	1.00	$0.053 \pm 0.02$	2.54(0.08)	2.85(0.08)	$\pm 0.10$	$7.35^{+1.1}_{-0.88} 10^{27}$
$^{130}\text{Te} \rightarrow ^{130}\text{Xe}$	1.25	$0.036^{+0.03}_{-0.009}$	2.95(0.12)	3.26(0.12)	$^{+0.26}_{-0.08}$	$2.16^{+0.33}_{-0.46} 10^{26}$
	1.00	$0.056^{+0.05}_{-0.15}$	2.34(0.07)	2.59(0.06)	$^{+0.27}_{-0.08}$	$3.42^{+0.51}_{-0.83} 10^{26}$
$^{136}\text{Xe} \rightarrow ^{136}\text{Ba}$	1.25	0.030	1.97(0.13)	2.11(0.11)		$4.55^{+0.68}_{-0.56} 10^{26}$
	1.00	0.045	1.59 (0.09)	1.70 (0.07)		$6.38^{+1.12}_{-0.91} 10^{26}$
	1.25	0	1.67(0.13)	1.78(0.11)		$7.00^{+0.84}_{-0.71} 10^{26}$
	1.00	0	1.26 (0.09)	1.35 (0.07)		$1.11^{+0.17}_{-0.14} 10^{27}$
$^{150}\text{Nd} \rightarrow ^{150}\text{Sm}$	1.25	$0.07^{+0.009}_{-0.03}$	4.16(0.16)	4.74(0.20)	$^{+0.06}_{-0.19}$	$2.23^{+0.41}_{-0.21} 10^{25}$
	1.00	$0.11^{+0.014}_{-0.05}$	3.30(0.16)	3.72(0.20)	$^{+0.06}_{-0.19}$	$3.55^{+0.87}_{-0.42} 10^{25}$

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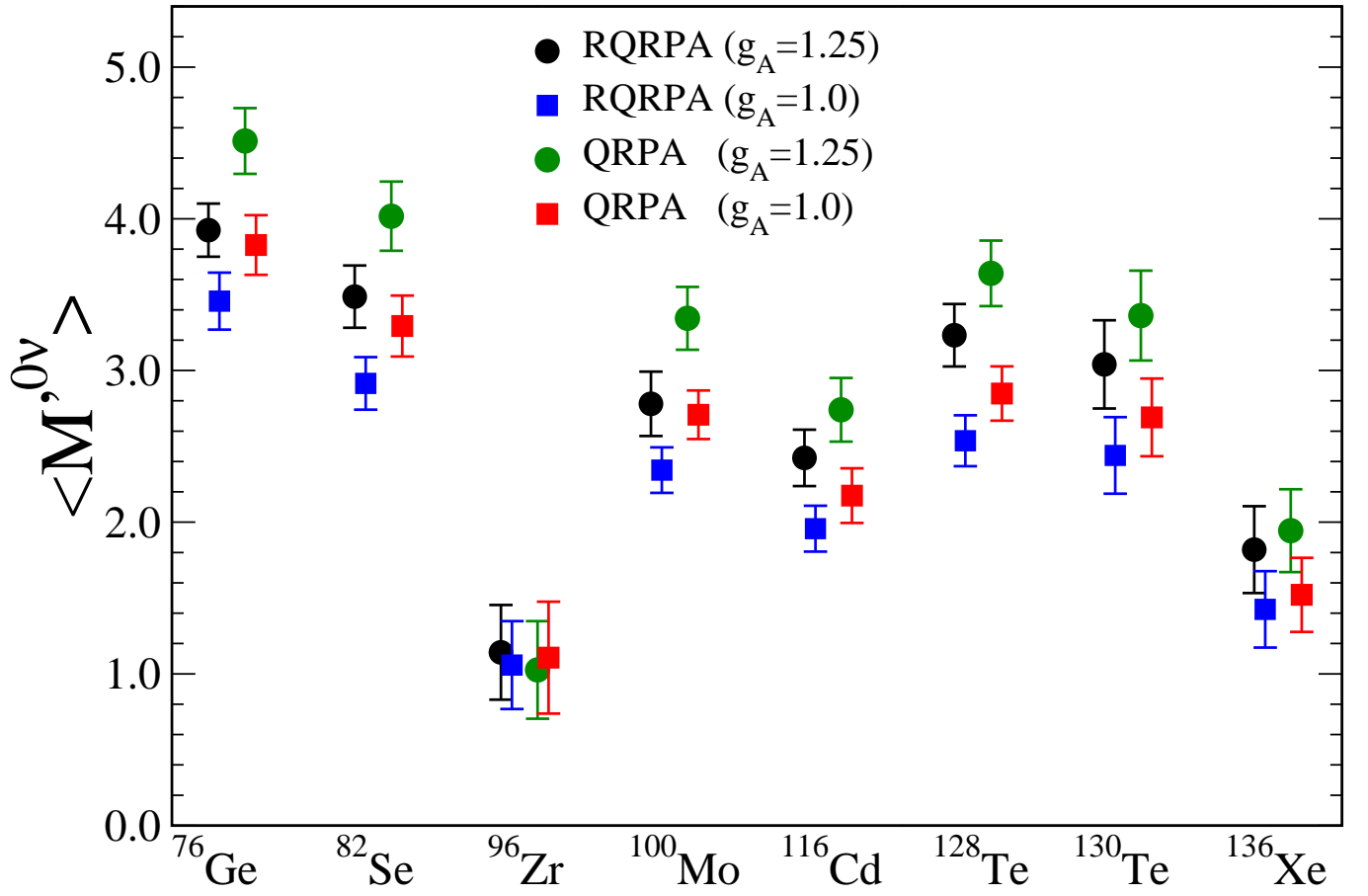


FIG. 1: Average nuclear matrix elements  $\langle M^{0\nu} \rangle$  and their variance (including the uncertainty coming from the experimental error in  $M^{2\nu}$ ) for both methods and for all considered nuclei. For  $^{136}\text{Xe}$  the error bars encompass the whole interval related to the unknown rate of the  $2\nu\beta\beta$  decay.